REMARKS

In response to the Office Action, Paper No./Mail Date 20071007, dated October 24, 2007, Applicants have carefully studied the references cited by the Examiner and the Examiner's comments relative thereto.

Claims 1-10 and 12-24 have been amended.

Claim 25 has been cancelled.

Claims 1-10 and 12-24 remain in the application.

No new matter has been added.

Reconsideration of the application, as amended, is respectfully requested.

Claim Objections

The Examiner objected to Claims 10, 20, and 22 for informal issues related to typographical errors and missing words. Claims 10, 20, and 22 have been amended to address the Examiner's objections and are now deemed allowable.

35 U.S.C. § 112

The Examiner rejected Claims 8-14, 17-21, and 22 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claims 8-14 have been amended to provide proper antecedent basis for each limitation set forth therein and to point out and distinctly claim the subject matter which the Applicants regard as the invention. Accordingly, Claims 8-14 are now in allowable form, and withdrawal of the rejections under 35 U.S.C. §112, second paragraph is respectfully requested.

Claim 17 has been amended for clarity and as recommended by the Examiner. Accordingly, Claim 17 and Claims 18-21, which depend directly or indirectly therefrom, are now in allowable form, and withdrawal of the rejections under 35 U.S.C. §112, second paragraph is respectfully requested.

Claim 22 has been amended to provide proper antecedent basis for each limitation set forth therein and to point out and distinctly claim the subject matter which the Applicants regard as the invention. Accordingly, Claim 22 is now in allowable form, and withdrawal of the rejection under 35 U.S.C. §112, second paragraph is respectfully requested.

35 U.S.C. § 103(a)

The Examiner rejected Claims 1 and 17 as being obvious over Hayden M. Reeve, et al., "Experimental and Numerical Investigation of Polymer Preform Heating", April 2001, Journal of Materials Processing & Manufacturing Science in view of Travis L. Turner, et al., "Numerical and Experimental Analyses of the Radiant Heat Flux Produced by Quartz Heating Systems", March 1994, NASA Technical Paper under 35 U.S.C. § 103(a).

The Examiner also rejected Claims 2-7 and 18-21 as being obvious over Reeve as modified by Turner and further in view of J.P. McEvoy, et al. "Simulation of the Stretch Blow Molding Process of PET Bottles", 1998, Advances in Polymer Technology; Claims 15 and 16 as being obvious over Reeve in view of Turner in further view of McEvoy; and Claim 22 as being obvious over Reeve, in view of Turner, in further view of McEvoy.

Applicants respectfully assert that the Examiner has failed to establish a prima facie case of obviousness in regards to independent Claims 1, 15-17, and 22 because one skilled in the art would not be motivated or have any suggestion to combine the references. More importantly, even if the references are combined, the combination of references does not produce each and every limitation of independent Claims 1, 15-17, and 22. Independent Claims 1, 15, and 16 recite a method for virtual prototyping of plastic containers or preforms comprising a step of "providing heating information and calculating temperatures of primary and secondary heating sources...". Similarly, Independent Claims 17 and 22 recite an apparatus for virtual prototyping of plastic containers including a "means for generating primary and secondary temperature heating sources for providing energy to said preform..." and "a preform module for: ... (a) solving energy equations based on inputs from... said temperature heating sources...". Indeed, none of the cited references require a primary heating source and a secondary heating source in the virtual prototyping of a plastic preform or container. As a result, no combination of references can properly serve as a basis for rejection of independent Claims 1, 15-17, and 22, nor any claim dependent therefrom, under 35 U.S.C. 103(a).

Claim 1 of the application recites (underlining added for emphasis):

> A method for simulating the heating of a plastic preform comprising the following steps:
> inputting a preform geometry into a preform design program;
> providing oven geometry and calculating spatial location of said preform through at least one oven;
> providing heating information and calculating temperatures of primary and secondary heating sources;
> solving energy equations based upon said preform geometry, said spatial location of said preform, said temperatures, cooling air and radiation absorption spectra of a material of said preform; and
> computing at least one cross sectional thermal profile of a final heated preform.

Claim 17 of the application recites (underlining added for emphasis):

> An apparatus for simulating the heating of a plastic preform comprising:
> means for inputting a preform geometry into a preform design program;
> means for generating oven geometry, said oven geometry defining oven parameters for providing a heating source to a preform, said oven geometry including spatial locations of said preform within said oven geometry;
> means for generating primary and secondary temperature of heating sources for providing energy to said preform; and
> a preform heating module for:
> (a) solving energy equations based on inputs from said preform geometry, said spatial location of said preform, said temperature heating sources, cooling air and spectra of a material of said preform;
> (b) computing at least one cross-sectional thermal profile of a final heated preform.

Claims 1 and 17 recite a method and apparatus, respectively, for the virtual prototyping of containers and performs. In performance of the virtual prototyping method of Claim 1, and in using the virtual prototyping apparatus of Claim 17, a preform and oven geometry are inputted into a design program along with the heating and temperature information of the primary and secondary heat sources [Claims 1 and 17]. The application defines the primary and secondary heating sources as "lamp wattage, lamp power settings, overall power, reflection coefficients, initial preform temperature, and ceramic coating" [para. 0022]. Furthermore, another factor accounted for is the "effect of cooling convective air current on an outer surface of the preform as well as a relatively insulated inner surface of the preform" [para. 0033]. Energy equations are then solved and a cross sectional thermal profile of a final heated preform are computer. To determine the cross sectional profile, the preform geometry is discretized (or digitized) into a plurality of small rectangular blocks, and an

amount of energy from the primary and secondary heating sources absorbed into each discretized block is used in calculating the energy incident and absorbed in an adjacent discretized block [para. 0026]. The radiation absorbed by each respective discretized block is incident to the exposure or viewing angle of each lamp as each respective discretized block travels through the oven [para. 0026; Fig. 5]. In other words, the energy absorbed by any discretized block depends directly on the location of and energy absorbed by an adjacent discretized block relative to the location and temperature of the primary and secondary heat sources.

Reeve discloses an experimental temperature model of a parison extrusion blow molded into a cylindrical furnace in the manufacture of polymer optical fiber (POF) [Abstract]. Reeve does not disclose, however, a method for virtual prototyping that includes heating information and calculating temperatures of primary and secondary heating sources. In fact, Reeve discloses that the numerical model underpredicted the transient heating at certain locations of the parison [para. 4, pg. 294]. The discrepancies are attributed to "additional heating from insulation and fixtures... which were not modeled". In other words, secondary heating sources were not considered in the experiment of Reeve [para. 4, pg. 294]. The Examiner even notes this, stating "Reeve does not specifically teach: calculating temperatures of primary and secondary heating sources". The Examiner asserts that Turner cures the defect of Reeve. The Examiner states "Turner appears to teach: calculating temperatures of primary and secondary heating sources [pg. 11, right-side column, starting at the second paragraph] that starts with, "A filament has a radiative power..."; and pages 2-3, section labeled "Scope of the President Study")." However, Turner does not disclose primary and secondary heating sources. Indeed, Turner discloses that the system includes a quartz lamp or a plurality of quartz lamps [top of pg. 3, left column], but that in simulating the heat produced by the quartz lamps, secondary heating sources are neglected. The secondary heating sources neglected by Turner include the gaseous environment surrounding and with the quartz envelope, and higher order effects such as scattering and birefringence, polarization induced by any process associated with the quartz [top of pg. 3, left column, first full paragraph]. Furthermore, Turner discloses that "a coarse approximation of the entire system is required in order to assign a radiative power (and temperature)" to the heat sources, and that "complicated systems require more refined preliminary simulations in order to converge upon these input parameters" [Pg. 11, right column, first full paragraph]. A thorough examination of Turner shows that it is completely devoid of any disclosure regarding simulation of

primary and secondary heat sources in the virtual prototyping of containers or performs. Therefore, since Turner discloses that secondary heat sources are neglected and that an approximation of the entire system is used, Turner teaches away from the present invention.

Furthermore, Reeve discloses an experimental temperature model of a parison extrusion blow molded into a cylindrical furnace in the manufacture of polymer optical fiber (POF) using the SIMPLER finite difference algorithm, while Turner discloses the model of a system includes a quartz lamp or a plurality of quartz lamps using the Monte Carlo method. Turner is devoid of any mention of the SIMPLER method, the modeling of parisons, polymer optical fiber, and the like. Accordingly, one skilled in the art would have no motivation to combine the Reeve and Turner references.

Accordingly, even if the Reeve and Turner references are combined, the combination does not produce every limitation of independent Claims 1 and 17, which recite a "calculating temperatures of primary and secondary heating sources". As discussed above, Reeve is devoid of any mention secondary heating sources, while Turner expressly neglects secondary heating sources and provides a "coarse approximation" of the entire system. Therefore, one skilled in the art would have no motivation to combine the Reeve and Turner references, and even if the references were combined, the combination of references fails to teach or suggest each and every limitation of independent Claims 1 and 17. As a result, this combination of references cannot properly serve as a basis for rejection of independent Claims 1 and 17 under 35 U.S.C. § 103(a), and Claims 1 and 17 are allowable.

The Examiner has failed to establish a prima facie case for Claims 2-7, depending from independent Claim 1, and Claims 18-21, depending from independent Claim 17, under 35 U.S.C. § 103(a) as being unpatentably obvious over Reeve in further view of Turner. Because Claims 2-7 and 18-21 contain at least the same limitations as Claims 1 and 17, respectively, as discussed above, Claims 2-7 and 18-21 are also allowable.

The Examiner has failed to establish a prima facie case for independent Claims 15 and 16 under 35 U.S.C. § 103(a) as being unpatentably obvious over Reeve in view of Turner in further view of McEvoy. Claims 15 and 16, like independent Claims 1 and 17, recite calculations of temperatures of primary and secondary heating sources and solving energy equations using the temperatures. Like Reeve and Turner, McEvoy does not teach the calculation of temperatures of primary and secondary heating sources and therefore does not cure the defects of Reeve and Turner. The Examiner relied on the McEvoy reference to cure a defect related to providing a stress/strain behavior of the material of a preform; however, a

thorough examination of McEvoy shows that it is completely devoid of any disclosure regarding simulation of primary and secondary heat sources in the virtual prototyping of containers or performs. Therefore as discussed above, there is no motivation to combine the references, and even if the references are combined, the combination does not produce the limitation of performing calculations of temperatures of primary and secondary heating sources in virtual prototyping of containers and performs. As a result, this combination of references cannot properly serve as a basis for rejection of independent Claims 15 and 16 under 35 U.S.C. § 103(a), and Claims 15 and 16 are allowable.

The Examiner has failed to establish a prima facie case for independent Claim 22 under 35 U.S.C. § 103(a) as being unpatentably obvious over Reeve in view of Turner in further view of McEvoy. Claim 22, like independent Claims 1 and 15-17, recites calculations of temperatures of primary and secondary heating sources and solving energy equations using the temperatures. For the reasons discussed above for Claims 15 and 16, one skilled in the art would have no motivation to combine the references, and even if the references were combined, the combination does not produce the limitation of performing calculations of temperatures of primary and secondary heating sources in virtual prototyping of containers and performs. As a result, this combination of references cannot properly serve as a basis for rejection of independent Claim 22 under 35 U.S.C. § 103(a), and Claim 22 is allowable.

For the foregoing reasons, withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

The other references cited by the Examiner, but not applied, have been studied and are not considered to be any more pertinent than the references relied upon by the Examiner.

It is submitted that the claims distinctly define the Applicants' invention and distinguish the same from the prior art. Reconsideration of the application, as amended, is respectfully requested. A formal Notice of Allowance is solicited.

While the Applicants' attorney has made a sincere effort to properly define Applicants' invention and to distinguish the same from the prior art, should the Examiner deem that other language would be more appropriate, it is requested that a telephone interview be had with the Applicants' attorney in a sincere effort to expedite the prosecution of the application.